

Monthly Marine Biotoxin Report

November 2012

Technical Report No. 12-25

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of November, 2012. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

Southern California Summary:

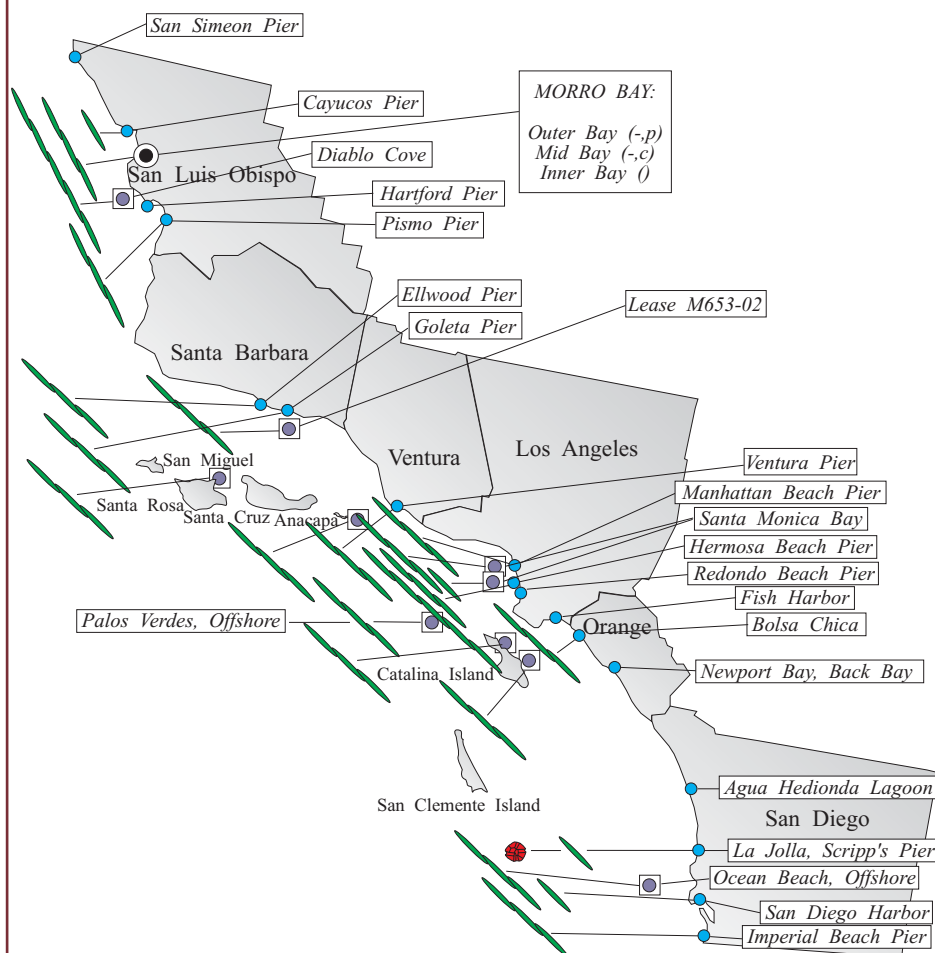
Paralytic Shellfish Poisoning

Alexandrium was observed at only one site in November (Figure 1). PSP toxins were not detected in any shellfish samples collected throughout the month (Figure 3).

Domoic Acid

Pseudo-nitzschia was observed along the
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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during November, 2012.



Relative Abundance of Known Toxin Producers

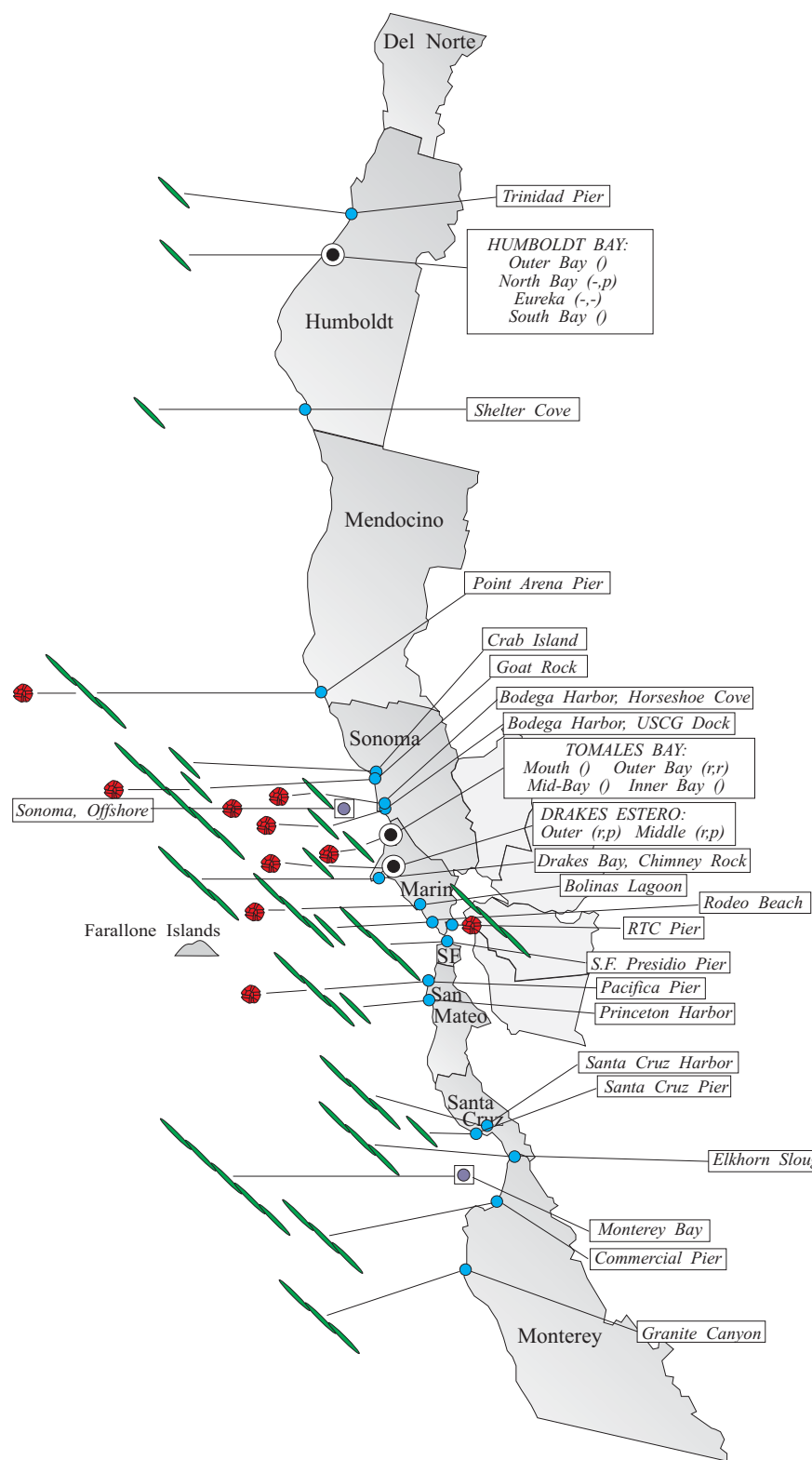
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (less than 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during November, 2012.



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entire southern California coast (Figure 1). The relative abundance of this diatom declined slightly at sites in San Luis Obispo County but increased offshore near the Channel Islands and at most sites between Ventura and San Diego counties. The highest relative abundances were observed offshore of Diablo Cove (November 8 and 27), near Santa Rosa Island (November 5), and offshore of Palos Verdes (November 14).

The low levels of domoic acid detected in Morro Bay at the end of October declined in early November, then increased slightly by the third week of the month (Figure 3). A low level of domoic acid was also detected briefly at an aquaculture lease offshore of Santa Barbara on November 12. A sample of lobster viscera collected between Santa Cruz and Santa Rosa islands on November 17 did not contain a detectable amount of toxin.

Non-toxic Species

The diatom *Chaetoceros* and the dinoflagellate *Ceratium* were common along the southern California coast.

Northern California Summary:

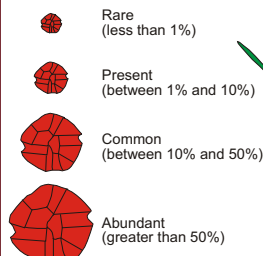
Paralytic Shellfish Poisoning

Alexandrium was observed between southern Mendocino and San Mateo counties in November (Figure 2). The relative abundance of this dinoflagellate was

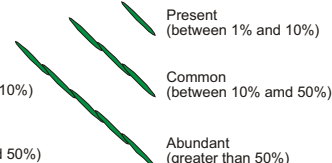
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Relative Abundance of Known Toxin Producers

Alexandrium Species



Pseudo-nitzschia Species



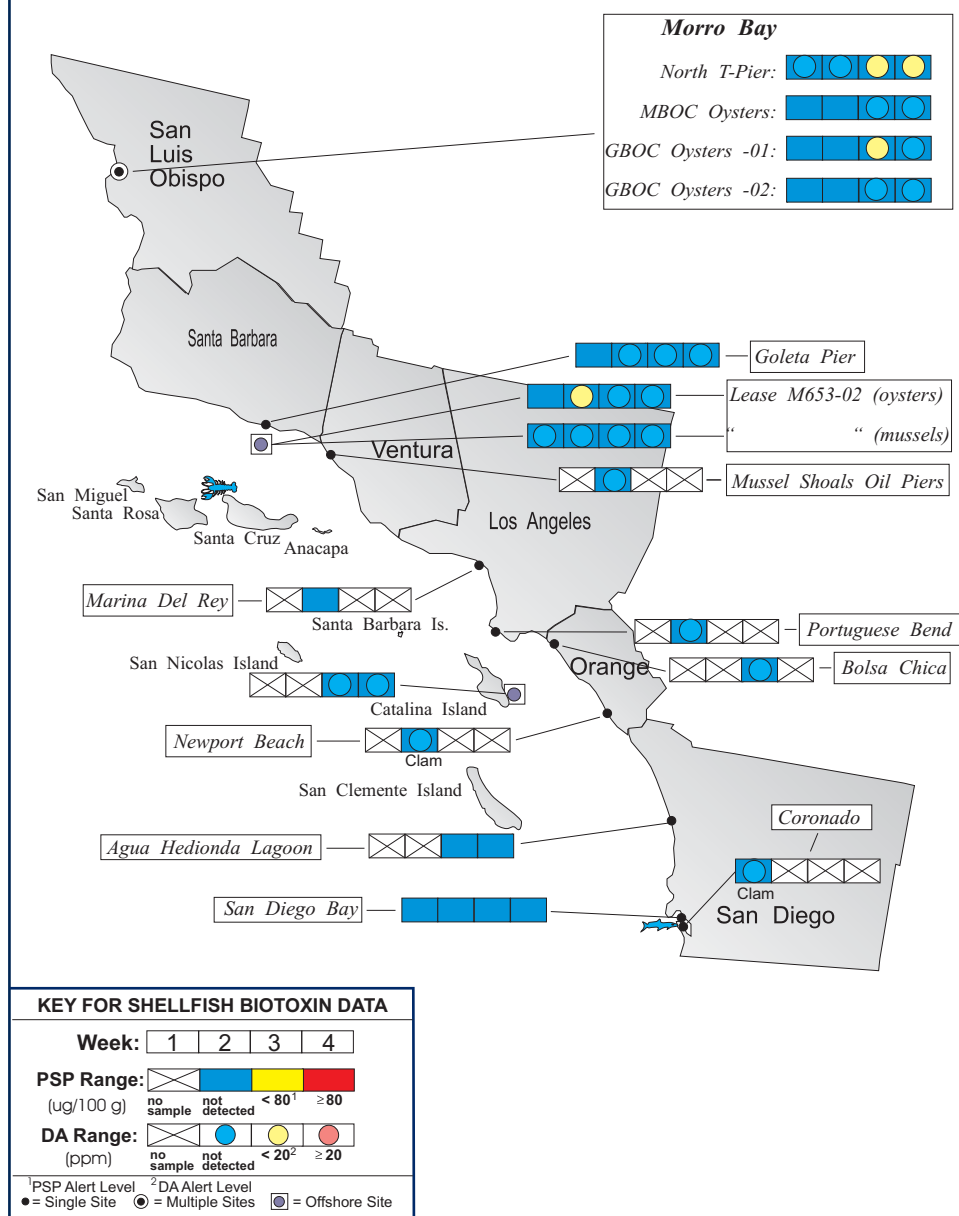
MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- ⊙ Multiple Sampling Stations
- ⊙ Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:

(A,P) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 3. Distribution of shellfish biotoxins in Southern California during November, 2012.



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low at all locations.

The high concentrations of PSP toxins detected in northern California in October persisted into November (Figure 4). A follow-up mussel sample collected by the Yurok Tribe Environmental Program just north of the Klamath River mouth in Del Norte County contained 1763 ug/100 g of toxins on November 4, a decline from the 6394 ug/100g detected at the end of October. High concentrations of PSP toxins were also detected at Point St. George throughout the month and at sites in Humboldt and Marin counties. Low toxin levels were detected in mussels from Sonoma and San Mateo counties. PSP toxins were not detected in samples of Dungeness crab viscera from Del Norte, Humboldt, and Sonoma counties.

Domoic Acid

Pseudo-nitzschia was common to abundant at sites between Mendocino and Monterey, however the cell mass was very low at all locations (Figure 2). Domoic acid was not detected in any shellfish samples analyzed in November (Figure 4). The majority of preseason Dungeness crab samples collected by the Department of Fish and Game and the CDPH Food and Drug Branch did not contain domoic acid.

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The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Public Health, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide effort designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:
(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553-4133

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Several crab viscera samples from the Sonoma coast contained low levels of this toxin.



QUARANTINES:

A health advisory was issued on November 6 for all bivalve shellfish in Del Norte County as a result of the dangerous levels of PSP toxins detected. This action followed the extension of the annual mussel quarantine for Humboldt and Del Norte counties on October 31.

The health advisory issued on September 14 for the northern Channel Islands remained in effect. This alert was issued as a result of high levels of domoic acid in samples of crab viscera, also known as 'crab butter'. The advisory warned consumers to avoid eating bivalve shellfish or the internal organs of crab, lobster, and small finfish like sardines and anchovies from the affected region.

Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams (*Siliqua patula*) are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat as well as in the viscera.

PSP toxins affect the human central nervous system, producing a tingling around the mouth and fingertips within a few minutes to a few hours after eating

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Figure 4. Distribution of shellfish biotoxins in Northern California during November, 2012.

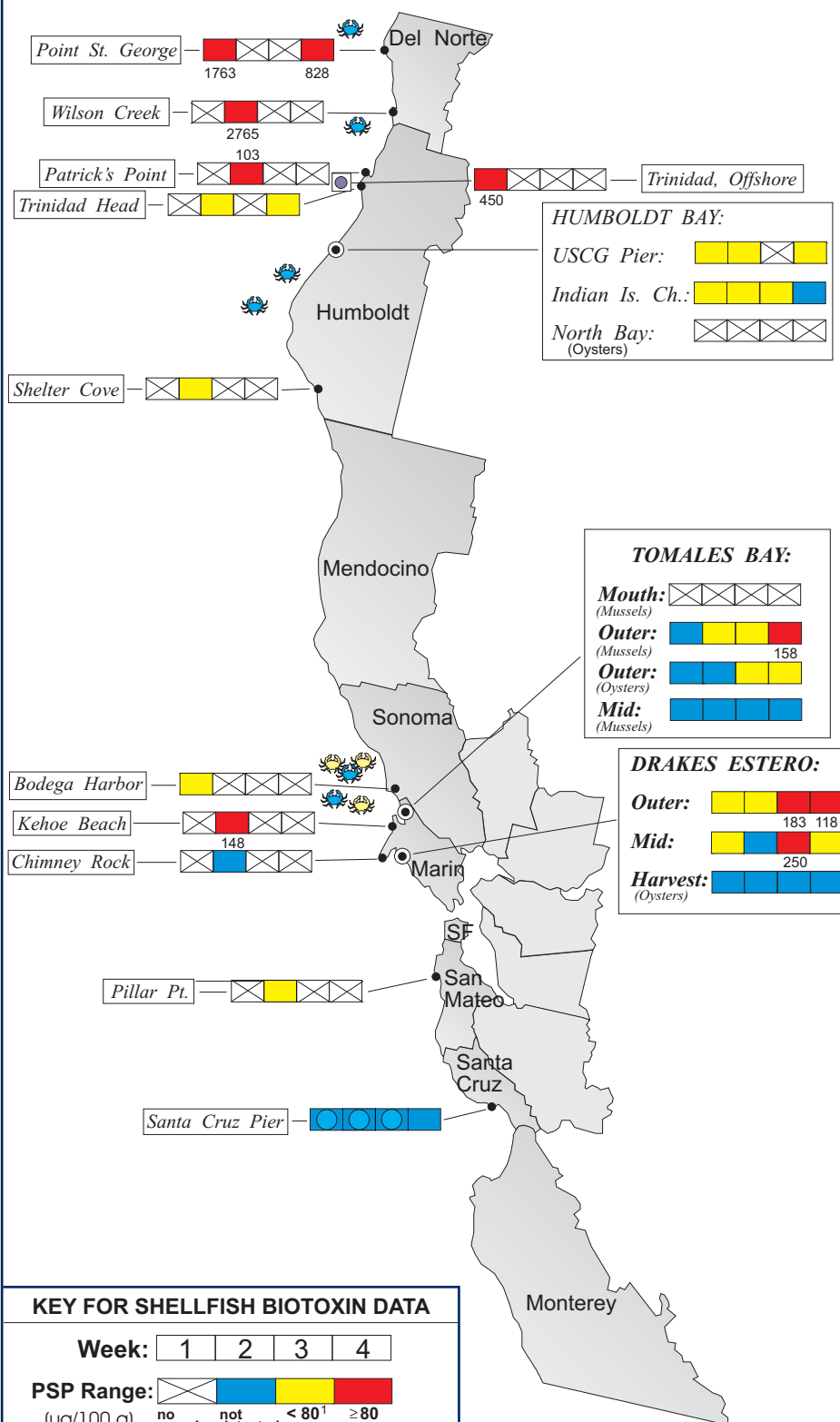


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during November, 2012.

COUNTY	AGENCY	#
Del Norte	Yurok Tribe Environmental Program	2
	CDPH Food and Drug Branch	8
	California Department of Fish and Game	2
Humboldt	Coast Seafood Company	9
	Humboldt County Environmental Health Department	3
	CDPH Volunteer (Georgianna Woods)	1
	CDPH Food and Drug Branch	6
	California Department of Fish and Game	1
	None Submitted	
	None Submitted	
Sonoma	CDPH Marine Biotoxin Program	1
	CDPH Food and Drug Branch	10
Marin	Cove Mussel Company	4
	Drakes Bay Oyster Company	27
	Hog Island Oyster Company	7
	Marin Oyster Company	5
	CDPH Marine Biotoxin Program	2
San Francisco	None Submitted	
San Mateo	CDPH Marine Biotoxin Program	1
Santa Cruz	U.C. Santa Cruz	4
Monterey	None Submitted	
San Luis Obispo	Grassy Bar Oyster Co.	10
	Morro Bay Oyster Company	6
Santa Barbara	Santa Barbara Mariculture Company	8
	U.C. Santa Barbara	4
	HABNet	1
Ventura	Ventura County Environmental Health Department	1
Los Angeles	Los Angeles County Health Department	2
	City of Los Angeles Environmental Monitoring Division	1
Orange	Amigos de Bolsa Chica	1
	CDPH Volunteer (Steve Crooke)	1
San Diego	Carlsbad Aquafarms, Inc.	2
	CDPH Volunteer (Steve Crooke)	1
	U.S. Navy Marine Mammal Program	5

Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during November, 2012.

COUNTY	AGENCY	#
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	4
	Humboldt State University Marine Lab	2
	Bureau of Land Management	2

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toxic shellfish. These symptoms typically are followed by disturbed balance, lack of muscular coordination, slurred speech and difficulty swallowing. In severe poisonings, complete muscular paralysis and death from asphyxiation can occur.

Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed. Contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.

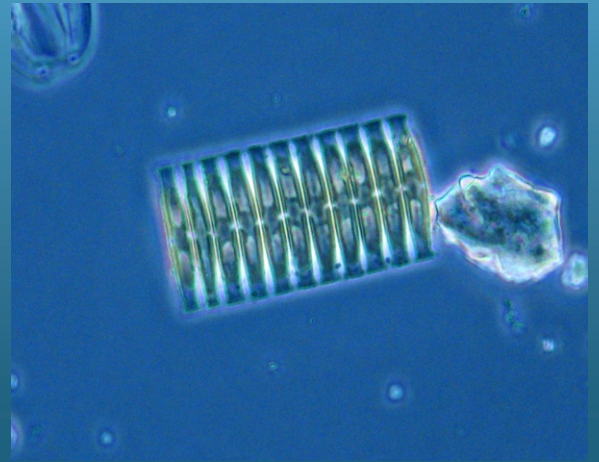


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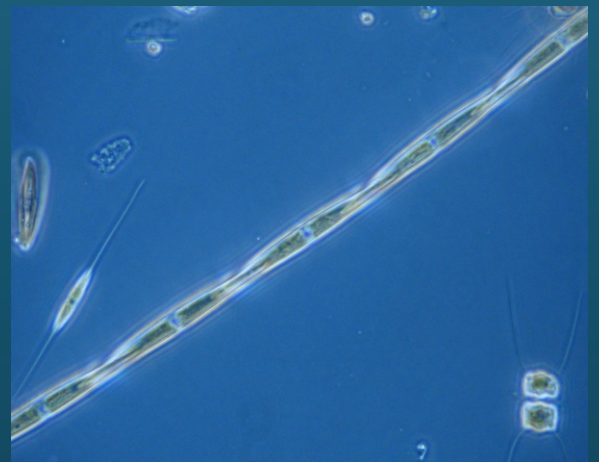
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Mendocino	CDPH Volunteer (<i>Marie de Santis</i>)	2
Sonoma	Bodega Marine Lab	2
	CDPH Marine Biotoxin Program	1
	Sonoma Coast Watch	2
Marin	Drakes Bay Oyster Company	15
	CDPH Volunteer (<i>Brent Anderson</i>)	5
	SFSU, Romberg Tiburon Center	4
	CDPH Marine Biotoxin Program	1
	Hog Island Oyster Company	1
Contra Costa	None Submitted	
Alameda	None Submitted	
San Francisco	CDPH Volunteer (<i>Eugenia McNaughton</i>)	2
San Mateo	The Marine Mammal Center (<i>Stan Jensen</i>)	4
	CDPH Marine Biotoxin Program	1
Santa Cruz	San Lorenzo Valley High School	2
	U.C. Santa Cruz	4
Monterey	Friends of the Sea Otter (<i>Janis Chaffin</i>)	2
	Monterey Abalone Company	1
	Marine Pollution Studies Laboratory	3
San Luis Obispo	Friends of the Sea Otter (<i>Kelly Cherry</i>)	4
	Grassy Bar Oyster Company	4
	Morro Bay National Estuary Program	1
	Monterey Bay National Marine Sanctuary	1
	Tenera Environmental	4
	The Marine Mammal Center (<i>P.J. Webb, Tim Lytsell</i>)	2
Santa Barbara	CDPH Volunteer (<i>Sylvia Short</i>)	4
	Santa Barbara Mariculture Company	4
	U.C. Santa Barbara	4
	HABNet/CDPH	1
Ventura	CDPH Volunteer (<i>Fred Burgess</i>)	2
	National Park Service	2
Los Angeles	Catalina Island Marine Institute	2
	City of Los Angeles Environmental Monitoring Division	3
	Los Angeles County Health Department	3
	Los Angeles County Sanitation District	3
	Long Beach Marine Institute	1
	Tole Mour	2
	Southern California Marine Institute	1
Orange	Amigos de Bolsa Chica	1
	California Department of Fish and Game	4
San Diego	Scripps Institute of Oceanography	4
	Carlsbad Aquafarms, Inc.	3
	San Diego Whale Watch	1
	Tijuana River National Estuary Research Reserve	5
	U.S. Navy Marine Mammal Program	2

PHYTOPLANKTON GALLERY



The chained, pennate diatom *Plagiogrammopsis*.



A chain of the diatom *Pseudo-nitzschia*, responsible for producing domoic acid.



The dinoflagellate *Ceratium macroceros* was one of several species in this genera observed during November.